

FIG. 4

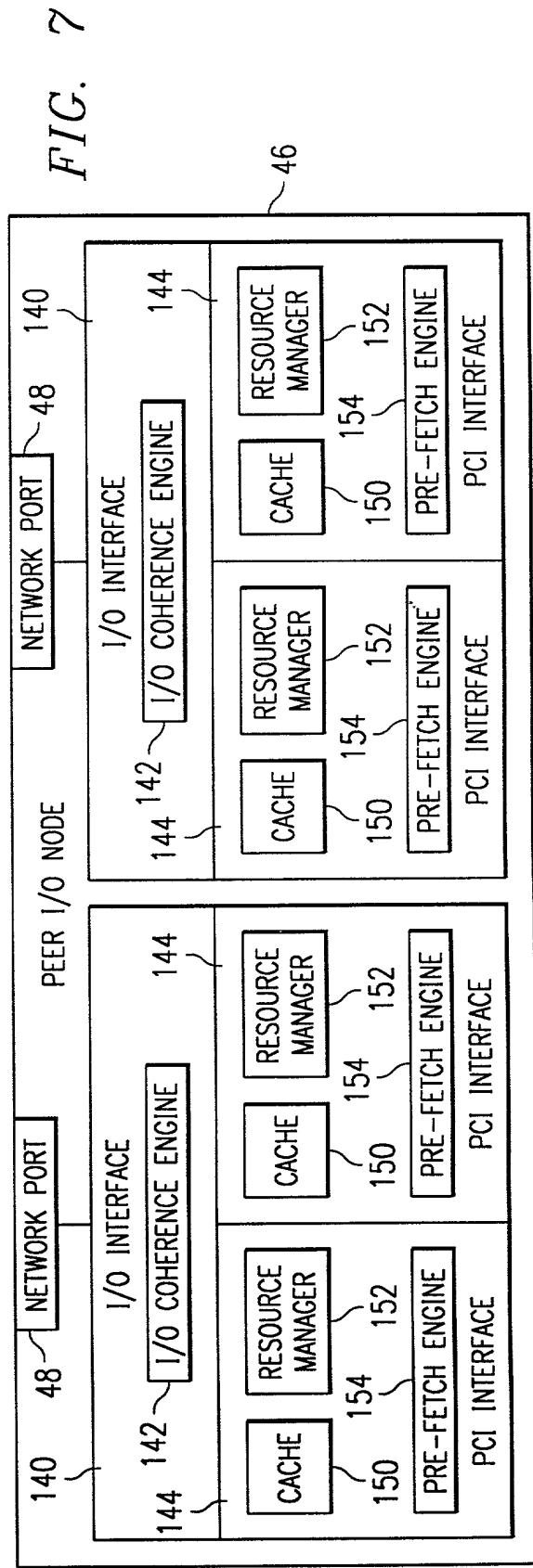
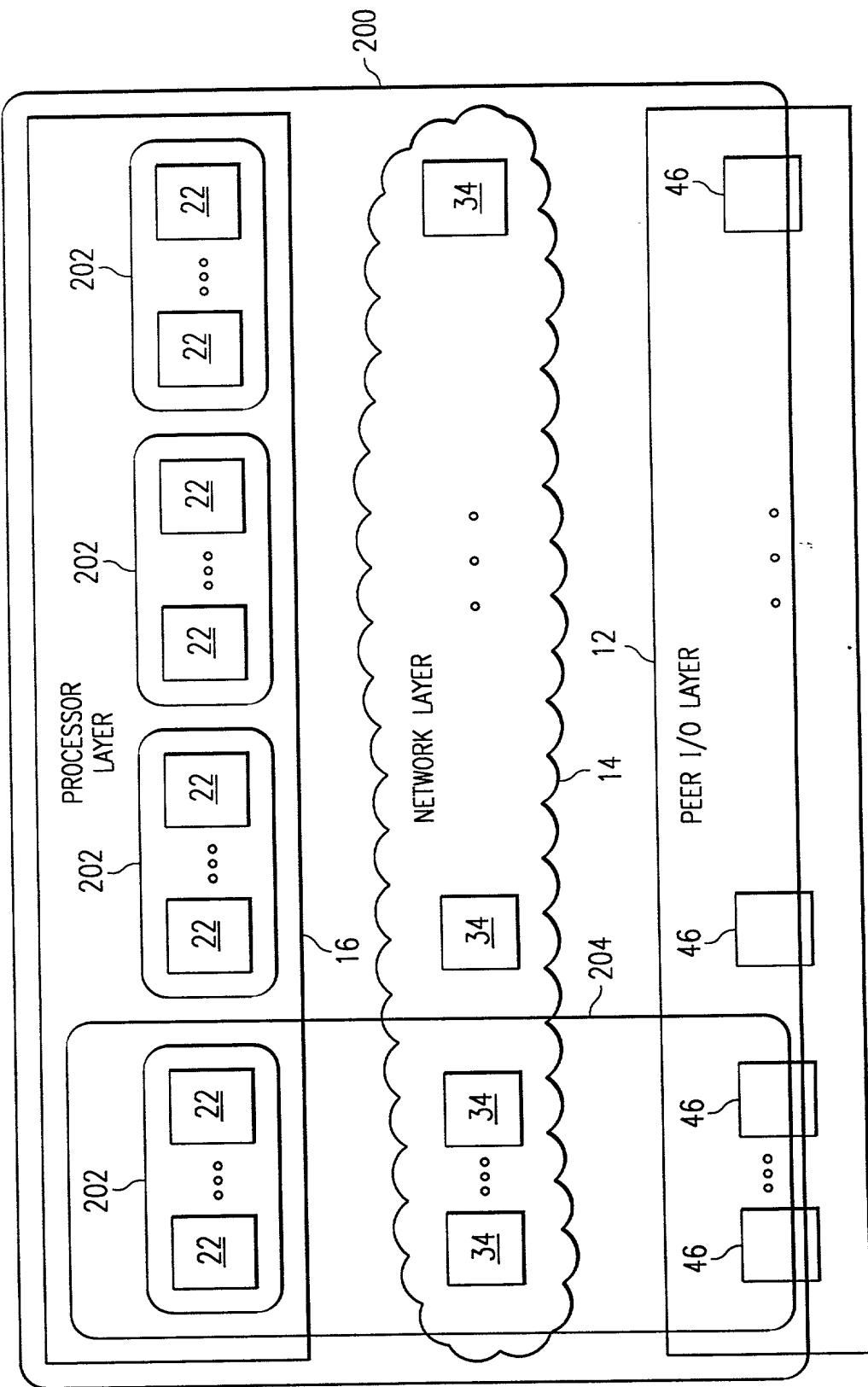


FIG. 8



The diagram illustrates a table of memory operation codes, organized into groups based on their function and access type. The groups are READ, WRITE, and PROBE. Within each group, operations are further categorized into sub-groups like SHARED, EXCLUSIVE, etc.

GROUP	NAME	DESCRIPTION	
READ	SHARED	READ	READ
		RDSHD	READ SHARED
	EXCLUSIVE	RDEXC	READ EXCLUSIVE
		RDXRO	EXCLUSIVE READ-ONLY TIMED
		RDXRN	EXCLUSIVE READ-ONLY UNTIMED
	etc.	GET	READ INVALID
		GETF	READ INVALID, FORCED
		AMOR	ATOMIC MEMORY OPERATION, READ
	NCRD	NON-COHERENT READ	
	WRITE	WRITEBACK	WRBK
WRBKR			WRITEBACK, CONCURRENT READ OUTSTANDING
IWE			IMPLICIT WRITEBACK EXCLUSIVE
RQSH			CEX DROP (RELINQUISH)
RQSHR			CEX DROP, CONCURRENT READ OUTSTANDING
PUT		PUT	WRITE INVALIDATE
		PFCL	CACHE LINE FLUSH
		AMOW	ATOMIC MEMORY OPERATION, WRITE
ETC.		NCWRD	NON-COHERENT WRITE, DOUBLEWORD
		NCWRF	NON-COHERENT WRITE, CACHE LINE
	INTER	INTERVENTION SHARED	
PROBE	EXCLUSIVE	INEXC	INTERVENTION EXCLUSIVE
		FLSH	FLUSH
		ERASE	ERASE
	GET	ININV	INTERVENTION INVALID
ININF		INTERVENTION INVALID, FORCED	
INVAL		INVALIDATE	
INVAL GENERATION	BINEV	BACKOFF INVALIDATE ECHO, VECTOR FORMAT	
	LINW	LOCAL BLOCK INVALIDATE VECTOR	

FIG. 9

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1002

1004

1006

FIG. 10A

GROUP	NAME	DESCRIPTION
SHARED	SRPLY	SHARED REPLY
	SRESP	SHARED RESPONSE
	SACK	SHARED ACKNOWLEDGE
	BINTR	BACKOFF INTERVENTION SHARED
EXCLUSIVE	ERPLY	EXCLUSIVE REPLY
	ESPEC	EXCLUSIVE SPECULATIVE REPLY
	ERESP	EXCLUSIVE RESPONSE
	EACK	EXCLUSIVE ACKNOWLEDGE
	ERPYP	EXCLUSIVE REPLY, SEND PRGE
	BIEXC	BACKOFF INTERVENTION EXCLUSIVE
	BINW	BACKOFF INVALIDATE, VECTOR FORMAT
	BINVP	BACKOFF INVALIDATE, POINTER FORMAT
READ	IRPLY	INVALID REPLY
	ISPEC	INVALID SPECULATIVE REPLY
	IRESP	INVALID RESPONSE
	IACK	INVALID ACKNOWLEDGE
	NACKG	NEGATIVE ACKNOWLEDGE TO GET
	BIINV	BACKOFF INTERVENTION INVALID
	BIINF	BACKOFF INTERVENTION INVALID FORCED
	AARP	AMO READ REPLY
ETC.	NCRP	NON-COHERENT READ REPLY
	NACK	COHERENT READ NEGATIVE ACKNOWLEDGE
WRITEBACK	WBACK	WRITEBACK ACKNOWLEDGE
	WBBACK	WRITEBACK BUSY ACKNOWLEDGE
WRITE	WACK	WRITE INVALIDATE ACKNOWLEDGE
	WACKP	WRITE INVALIDATE ACK, SEND PRGE
	WNACK	WRITE INVALIDATE NEGATIVE ACKNOWLEDGE

TO FIG. 10B

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FIG. 10B

FROM FIG. 10A

1012	WRITE	PUT	BFLSH	BACKOFF FLUSH	1012b
			BERSE	BACKOFF ERASE	
		ETC.	AWAK	AMO WRITE ACKNOWLEDGE	
			NCWAK	NON-COHERENT WRITE ACKNOWLEDGE	
1014	PROBE	SHARED	SHWB	SHARING WRITEBACK	1014a
			DNGRD	DEGRADE	
			SHWBR	SHARING WRITEBACK, PRIOR WB PENDING	
			DNGDR	DEGRADE WITH PRIOR WB PENDING	
1014	EXCLUSIVE	EXCLUSIVE	PRGE	PURGE	1014b
			XFER	OWNERSHIP TRANSFER	
			PRGER	PURGE WITH PRIOR WB PENDING	
			XFERR	OWNERSHIP TRANSFER, PRIOR WB PENDING	
1016	ERROR	ERROR	IWACK	IMPLICIT WRITEBACK RACE ACKNOWLEDGE	1014c
			GET	INTERVENTION INVALID ACK	
			ETC.	INVALIDATE ACK	
			PERR	POISONED ACCESS ERROR	
1016	ERROR	ERROR	AERR	READ PROTECTION VIOLATION ERROR	1014d
			WERR	WRITE PROTECTION VIOLATION ERROR	
			DERRR	DIRECTORY ERROR ON A READ REQUEST	
			DERRW	DIRECTORY ERROR ON A WRITE REQUEST	

FIG. 11

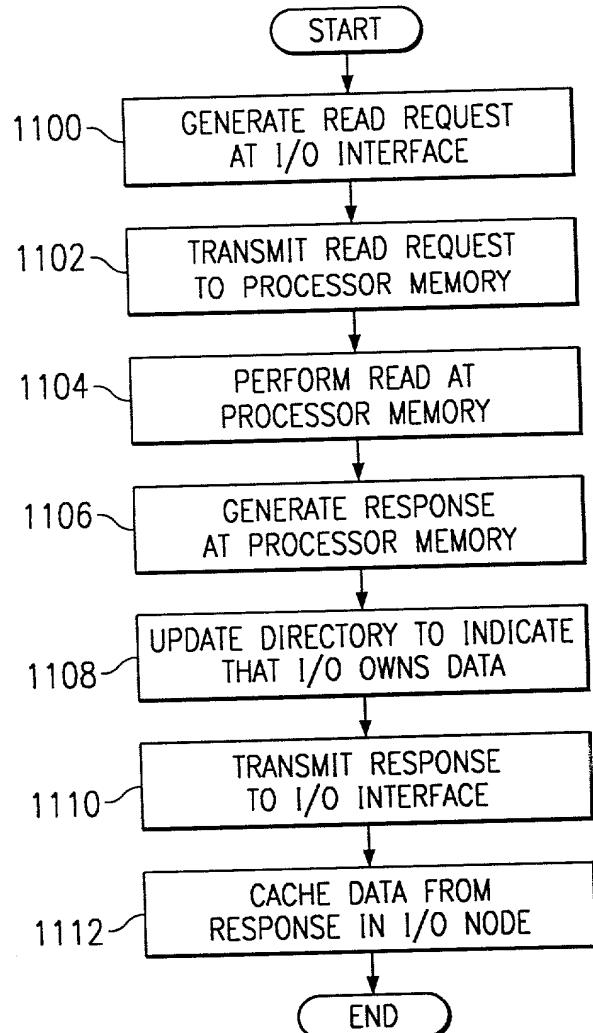


FIG. 12

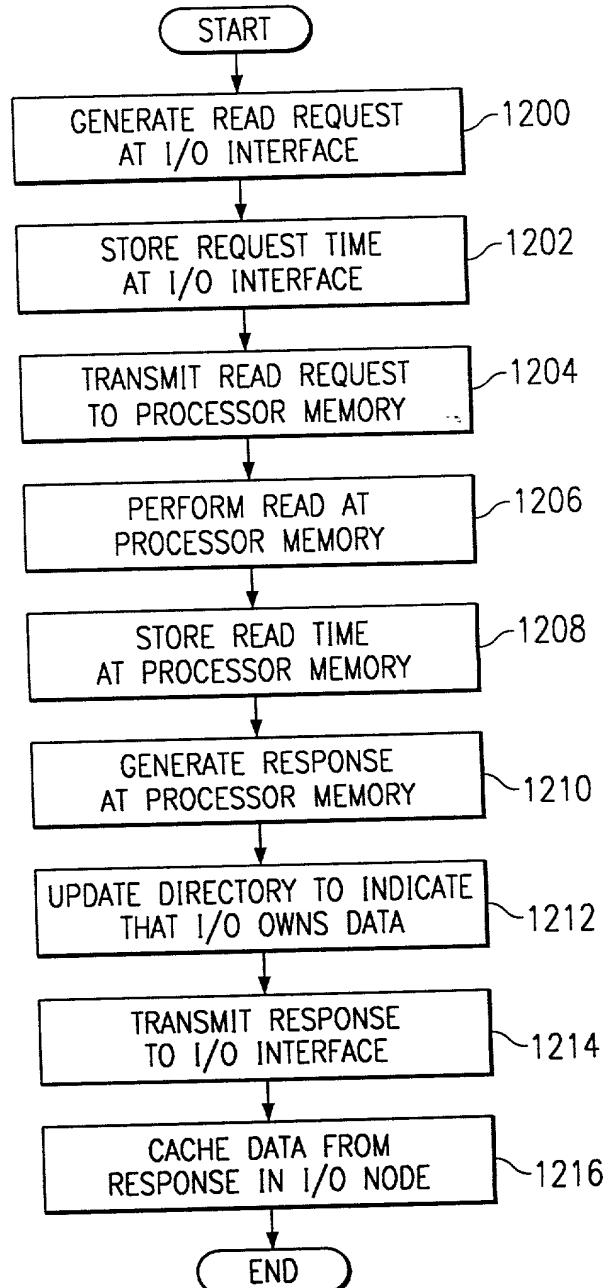


FIG. 13

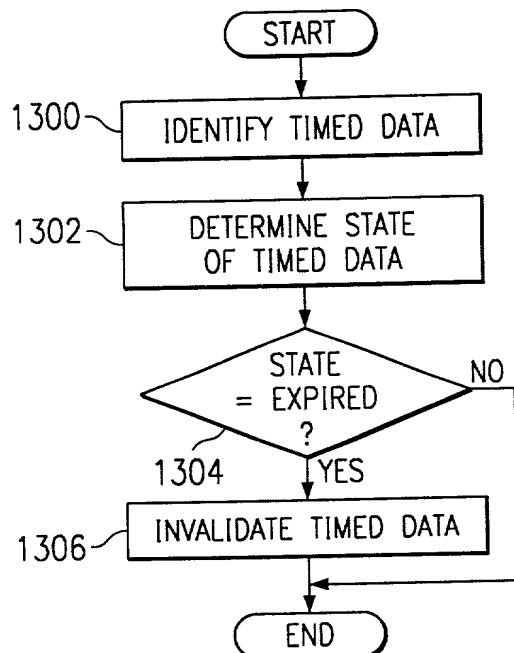


FIG. 14

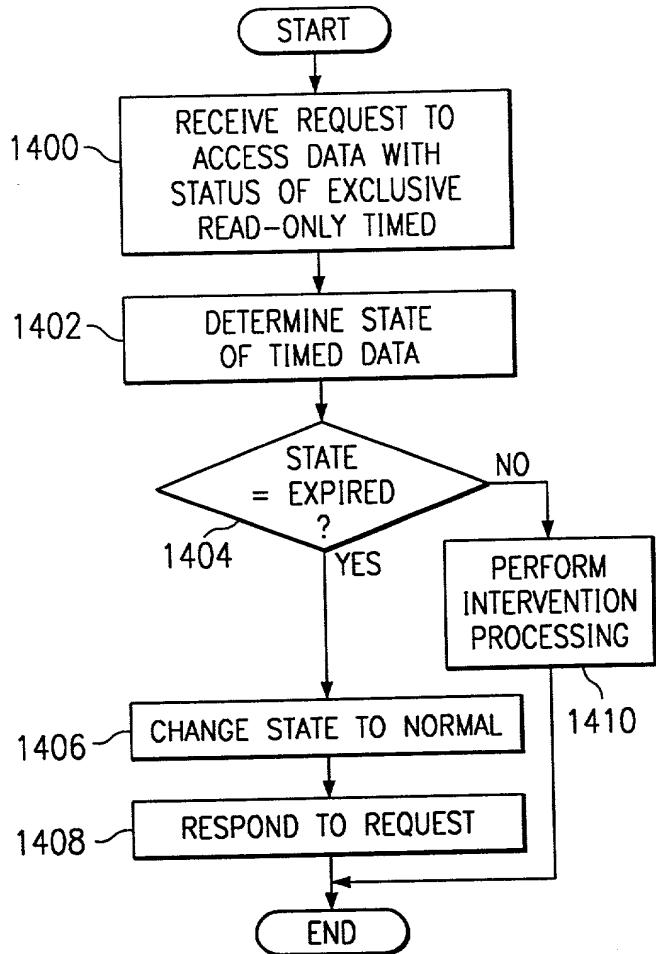


FIG. 15

